To: Mr. Chas. J. McCarthy

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NATIONAL ADVISORY COMMITTEE
FOR AERONAUTICS
NAVY BUILDING
WASHINGTON, D. C.

TELEPHONE: NATIONAL 5212

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From: Technical Assistant in Europe,
N.A.C.A.

To: National Advisory Committee for Aeronautics,
Washington, D. C.

Subject: Notes on New French Commercial Airplanes.

The new airplanes ordered for Air France, the Wibault 670 18-passenger low-wing monoplane and the Potez 620 14-passenger high-wing monoplane, are now under test at Villacoublay.

Air France has ordered one example of the Wibault and six of the Potez. The latter is merely a "civilized" version of the type 54 multiplace fighter (of which 135 examples have been ordered by the Air Ministry) but with two 820 horsepower 14 Krsd Gnome-Rhone engines instead of two 690 horsepower 12 Xbrs Hispanos. The particular Gnome-Rhone engines used are the semisupercharged type develop-

ing their rated power at 2,180 m (7,152 ft.), but giving 1,065 horsepower for take-off purposes at sea level.

The Wibault 670 is a modern transport airplane naturally strongly reminiscent of Douglas practice while bearing a family likeness to the Wibault 283. The power plant is the same as that of the Potez 620.

Mr. Wibault's factory is still at Courbevoie but within a month it is to be transferred to the Bréguet factory at Villacoublay-Vélizy.

Mr. Wibault showed me the plans of a 46-passenger low-wing monoplane which he designed in June 1934, but which has not yet been ordered. The power plant would consist of four Gnome-Rhone 14 Krsd engines well forward of the leading edge and giving the calculated top speed of 250 mi./hr. From the passengers' viewpoint, an interesting feature of this airplane is the large lounge and bar placed at the center of gravity of the airplane. Mr. Wibault likewise pointed out that the height of the various cabins would be not less than 8 feet.

Now approaching completion are four 30-seat low-wing monoplanes which will be added to the fleet of Air France late this year. These are the Dewoitine 620 and the Bloch 300, each with three Gnome-Rhone 14 Krsd engines. One example of each make is being paid for by Air France and the

other by the Air Ministry. The government-owned airplanes will be assigned to Air France by a hire-purchase agreement.

On a visit to the small Bloch factory at Courbevoie I inspected the fuselage and wings of the type 300, the first example of which should be completed by the end of May.

Other aircraft recently delivered to Air France or shortly to be placed in service and too well known to warrant description, are the following:

Airplanes

3	Dewoitine D.333	(3 575 hp. Hispano Cyclone)*
6	Bréguet 393	(3 350 hp. Gnome-Rhone 7 Kds)
17	Wibault 283	(3 350 hp. Gnome-Rhone 7 Kds)

Seaplanes

8	Lioré and Olivier H 242	(4 350 hp. Gnome-Rhone 7 Kd)
2	Bréguet-Short "Saigon"	(3 785 hp. Hispano 12 Ybr)

*Total weight, 9,956 kg (21,949.2 lb.); maximum speed, 287 km/h (178.3 mi./hr.); cruising speed at 2/3 power, 237 km/h (147.3 mi./hr.); load factor, 7.

Wibault 670 (2 Gnome-Rhone 14 Krsd)

Mr. Wibault has built only one example of this type which is now under test at Villacoublay. It is a low-wing monoplane, following in general the Douglas formula, but with certain distinctive Wibault characteristics. As seen from the general-arrangement plans and photographs (figs. 1, 2, 3, and 4), the engine nacelles project well above the upper wing surface for their entire length in order to house properly the electrically operated Breguet retractable landing gear.

The wing structure comprises two duralumin spars. Slotted ailerons divided into two sections on each side extend over almost the entire span, the outer sections being used for lateral control and the inner sections being lowered by an electric motor to reduce the landing speed by changing the angle of incidence of the wing.

The stabilizer is adjustable about its forward spar, the pilot changing the angle by means of a cable running from a wheel to a drum at the tail connected with a worm gear driving a couple of eccentrics. In addition, the elevators and rudder have Flettner flaps adjustable in flight.

Behind the pilots' seats is the radio operators' station which in turn is followed by the cabin for 18 passengers each of whom has his own window.

The soundproofing of the airplane has been entrusted to Mr. S. J. Zand, of the Sperry Company.

Potez 620 (2 Gnome-Rhone 14 Krsd)

This airplane (figs. 5 and 6), the first of six ordered by Air France, is now undergoing test flights at Villacoublay. It is merely a modification of the Potez 54 multiplace fighter and is really an interim design intended to meet the competition of foreign companies as regards performance pending the production of airplanes of really modern design.

The wings are of duralumin covered with fabric and the fuselage is of wood. The cabin accommodates 14 passengers.

The landing wheels retract into the engine nacelles which are slung well below the braced high wing.

Characteristics of Wibault 670 and Potez 620 Airplanes

	Wibault 670	Potez 620
Engines	2 Gnome-Rhone 14 Krsd	2 Gnome-Rhone 14 Krsd
Power/altitude	2 X 820 hp./2000 m (6562 ft.)	2 X 820 hp./2000 m (6562 ft.)
Number of passengers	18	14
Span	24.864 m (81.57 ft.)	22.35 m (73.33 ft.)

Characteristics (Cont.)

	Wibault 670	Potez 620
Length	18.742 m (61.49 ft.)	17.3 m (56.76 ft.)
Height	5.225 m (17.14 ft.)	3.9 m (12.80 ft.)
Wing area	78.6 m^2 (846.04 sq.ft.)	76.0 m^2 (818.06 sq.ft.)
Weight empty (equipped)	5613.0 kg (12374.53 lb.)	4720.0 kg (10405.8 lb.)
Fuel and oil	1115.0 kg (2458.15 lb.)	900.0 kg (1984.2 lb.)
Crew	240.0 kg (529.11 lb.)	160.0 kg (352.7 lb.)
Passengers and luggage	1620.0 kg (3571.48 lb.)	1260.0 kg (2777.8 lb.)
Freight	412.0 kg (908.30 lb.)	160.0 kg (352.7 lb.)
Total useful load	3387.0 kg (7467.05 lb.)	2480.0 kg (5467.5 lb.)
Total weight	9000.0 kg (19841.58 lb.)	7200.0 kg (15873.3 lb.)
Required performances:		
Cruising speed at 62½ percent power at 1500 m (4920 ft.)	275.0 km/h (170.9 mi./hr.)	265.0 km/h (164.7 mi./hr.)
Range with above pay load	1000.0 km (621.4 mi.)	1000.0 km (621.4 mi.)

Note on Wibault.- For 2,000 km (1,242.7 mi.) range, 2,227 kg (4,909.7 lb.) fuel carried, reducing pay load to 920 kg (2,028.3 lb.) (8 passengers and luggage and 200 kg (440.9 lb.) freight).

Note on Potez.- Preliminary tests at Villacoublay give a maximum speed of 325 km/h (201.9 mi./hr.) at 1,500 m (4,921 ft.). Above cruising speed therefore should be exceeded. Makers claim a cruising speed of 280 km/h (174 mi./hr.), a ceiling of 7,500 m (24,606 ft.) (4,000 m (13,123 ft.) on one engine) and speed of 200 km/h (124.3 mi./hr.) on one engine.

Dewoitine D.620 (3 820 hp. Gnome-Rhone 14 Krsd)

The first of the two 30-seat Dewoitine monoplanes is nearly finished at the Toulouse factory and will be delivered to the Service Technique early this summer. The airplane follows usual Dewoitine practice in having a single spar.

The smooth wing covering is of Vedal and there are split flaps at the trailing edge.

The fuselage is of monocoque structure made up of longerons, formers, and stringers. It is divided into two parts:

A. Nose freight compartment
Pilots' compartment
Radio station
Luggage compartment
Cabin for 9 passengers (3 abreast)

B. Cabin for 21 passengers (3 abreast)
Bar
Lavatory
Second luggage compartment

Chrome-molybdenum steel is used for engine mounts and landing gear. The latter, of the retractable type, is operated by compressed air and has Messier oleo-pneumatic

shock absorbers.

The metal tail surfaces include an adjustable stabilizer.

The four gasoline tanks have a total capacity of 2,400 liters (634 gallons) and are equipped with dump valves. Behind each engine is an oil tank containing 30 liters (7.925 gallons).

The three-blade propellers will probably be of the new Gnome-Rhone infinitely variable controllable pitch type.

General-arrangement plans (fig. 7) and cabin plans (fig. 8) are attached as well as the characteristics and detailed estimated performances.

Bloch 300 (3 820 hp. Gnome-Rhone 14 Krsb)

The first of these two 30-seat monoplanes is approaching completion and should be delivered to Villacoublay by the end of May. The attached general-arrangement plans (fig. 9) show the design. The wing construction with one main and one subsidiary spar follows the simple methods hitherto adopted by marcel Bloch, altered however to permit smooth wing plating instead of with the longitudinal extruded T-section stiffeners characteristic of type 200.

The fuselage is built up of Vedal (Alclad) with close-

ly spaced internal longitudinal and transverse channel section stiffeners, to which the covering is riveted. As a safeguard against buckling there is a steel gusset plate at each intersection. The fuselage contains two principal cabins with seats arranged four abreast. At the demand of the Air Ministry the windows are large enough for exit, the glass panels being readily unshipped.

At the back of the rear cabin are two doors on each side.

The landing wheels retract forward into the wing engine nacelles which do not project above the upper wing surface. The split flaps are hydraulically operated. There is a Flettner control of the rudder and the stabilizer is adjustable.

Characteristics of Dewoitine D.620 and Bloch 300 Airplanes

	Dewoitine D.620	Bloch 300
Engines	3 Gnome-Rhone 14 Krsd	3 Gnome-Rhone 14 Krsd
Power/altitude	3 X 820 hp./2000 m (6562 ft.)	3 X 820 hp./2000 m (6562 ft.)
Span	29.36 m (96.32 ft.)	27.2 m (89.24 ft.)
Length	23.59 m (77.39 ft.)	25.7 m (84.32 ft.)
Height	5.73 m (18.80 ft.)	5.5 m (18.04 ft.)

	Dewoitine D.620	Bloch 300
Wing area	97.34 m^2 (1047.76 sq.ft.)	100.0 m^2 (1076.39 sq.ft.)
Weight empty	6900.0 kg (15211.88 lb.)	7013.0 kg* (15461.0 lb.)
Equipment (radio, etc.)	210.0 kg (462.97 lb.)	167.0 kg (368.17 lb.)
Fuel and oil	1300.0 kg (2866.0 lb.)	1400.0 kg (3086.47 lb.)
Crew	270.0 kg (595.25 lb.)	270.0 kg (595.25 lb.)
30 passengers & luggage	2700.0 kg (5952.47 lb.)	2700.0 kg (5952.47 lb.)
Freight	480.0 kg (1058.22 lb.)	480.0 kg (1058.22 lb.)
Total useful load	4960.0 kg (10934.92 lb.)	4960.0 kg (10934.92 lb.)
Total weight	11860.0 kg (26146.79 lb.)	12020.0 kg (26499.53 lb.)

Required performances:

Cruising speed at 55 percent power at 1500 m (4921 ft.): 265.0 km/h (164.66 mi./hr.)

Duration with 3180 kg (7010.7 lb.) pay load: 3-1/2 hours

Duration with 2700 kg (5952.47 lb.) pay load (20 passengers & luggage, 1800 kg (3968.3 lb.)) and 900 kg (1984 lb.) freight: 5-1/2 hours

Normal flight at 2000 m (6562 ft.) with one engine stopped and the others operating at not exceeding 2/10 nominal power.

*Empty weight of Bloch analyzed as follows: (See next page)

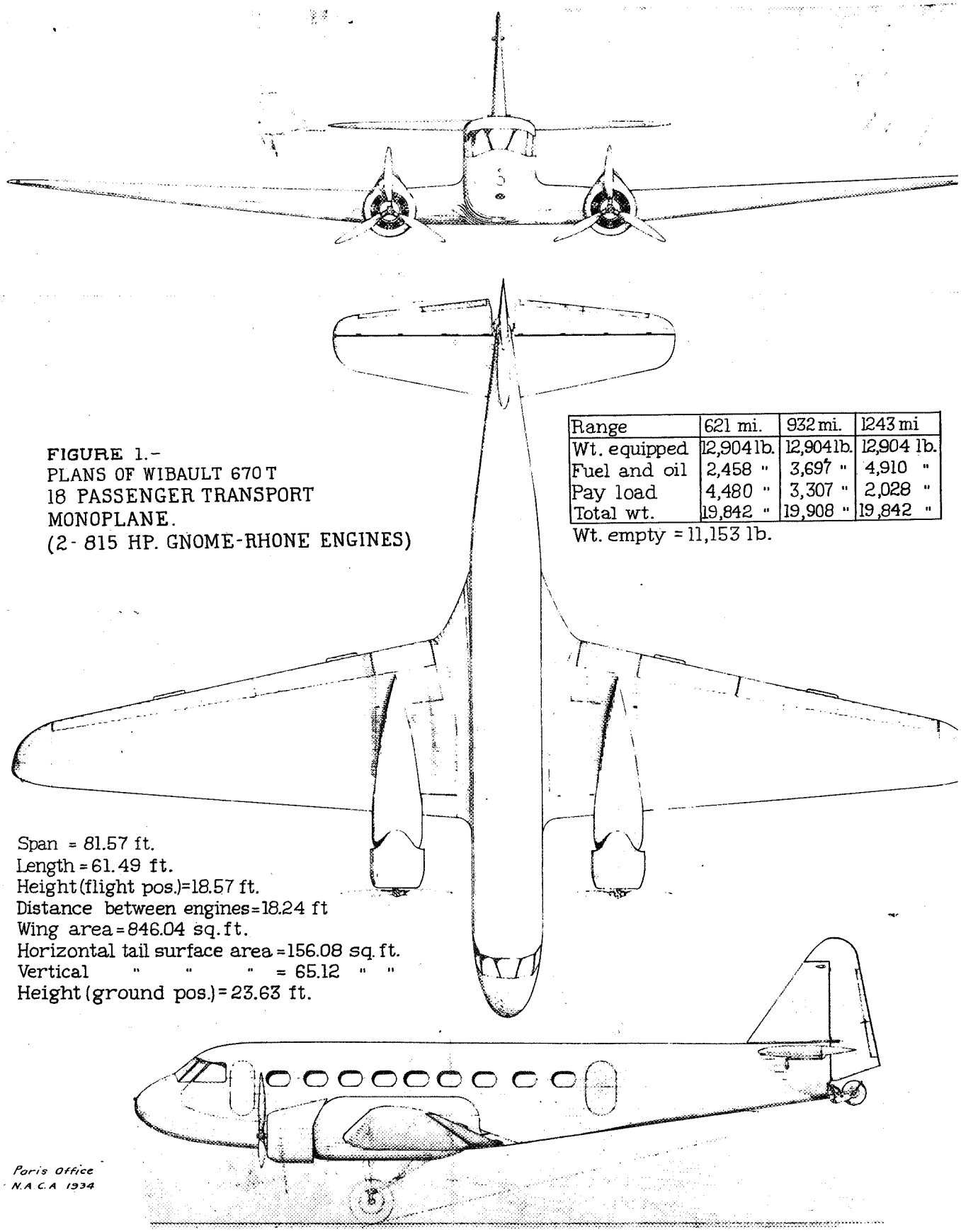
(*Footnote continued from page 10)

Weight less power plant	3970 kg	(8752.3 lb.)
Weight of engines	1793 "	(3952.9 ")
Weight of engine accessories	650 "	(1433.0 ")
Weight of tanks	105 "	(231.5 ")
Weight of fixed installations	495 "	(1091.3 ")
Total	7013 kg	(15461.0 lb.)

Maker's Estimated Performances of Dewoitine D.620

Maximum speed at sea level	310 km/h	(192.6 mi./hr.)
Maximum speed at 2000 m (6562 ft.)	350 "	(217.5 ")
Cruising speed at 1500 m (4921 ft.) at 55 percent of power	270 "	(167.8 ")
Speed with one engine stopped, others at 90 percent power at 1500 m (4921 ft.)	280 "	(174.0 ")
Speed with one engine stopped, others at full throttle at 2000 m (6562 ft.)	300 "	(186.4 ")
Landing speed	102 "	(63.4 ")
Ceiling	7700 m	(25260 ft.)
Ceiling with one engine stopped	5200 "	(17060 ")

(Signed) John Jay Ide.



Range	621 mi.	932 mi.	1243 mi
Wt. equipped	12,904 lb.	12,904 lb.	12,904 lb.
Fuel and oil	2,458 "	3,697 "	4,910 "
Pay load	4,480 "	3,307 "	2,028 "
Total wt.	19,842 "	19,908 "	19,842 "

Wt. empty = 11,153 lb.

FIGURE 1.-
PLANS OF WIBAULT 670 T
18 PASSENGER TRANSPORT
MONOPLANE.
(2 - 815 HP. GNOME-RHONE ENGINES)

Span = 81.57 ft.
Length = 61.49 ft.
Height (flight pos.) = 18.57 ft.
Distance between engines = 18.24 ft
Wing area = 846.04 sq. ft.
Horizontal tail surface area = 156.08 sq. ft.
Vertical " " " = 65.12 " "
Height (ground pos.) = 23.63 ft.

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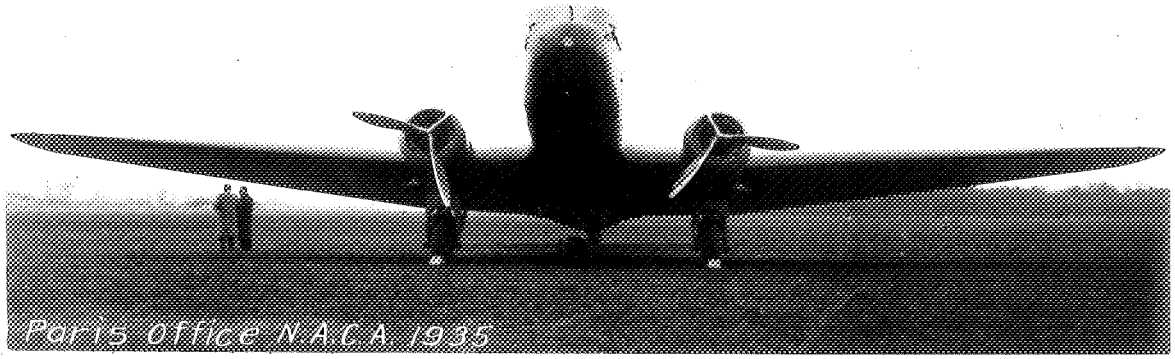
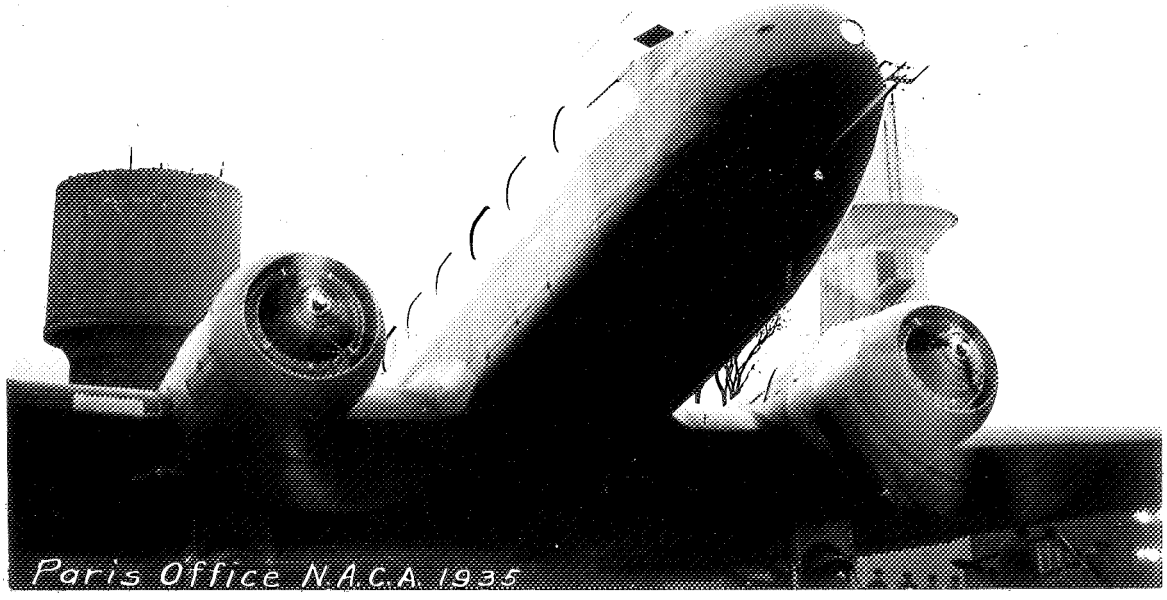
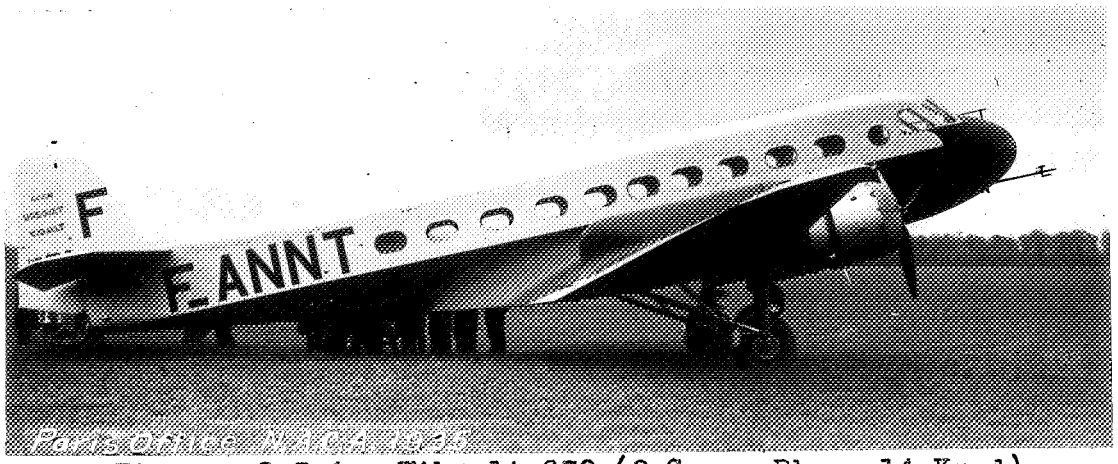
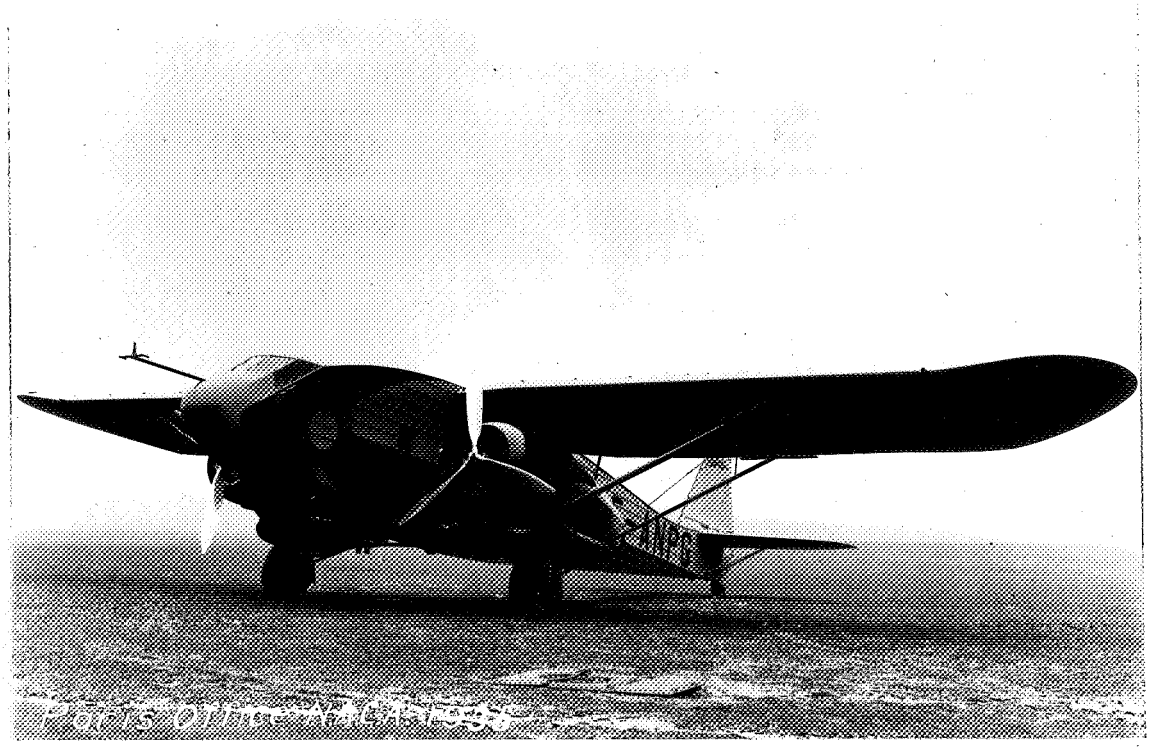


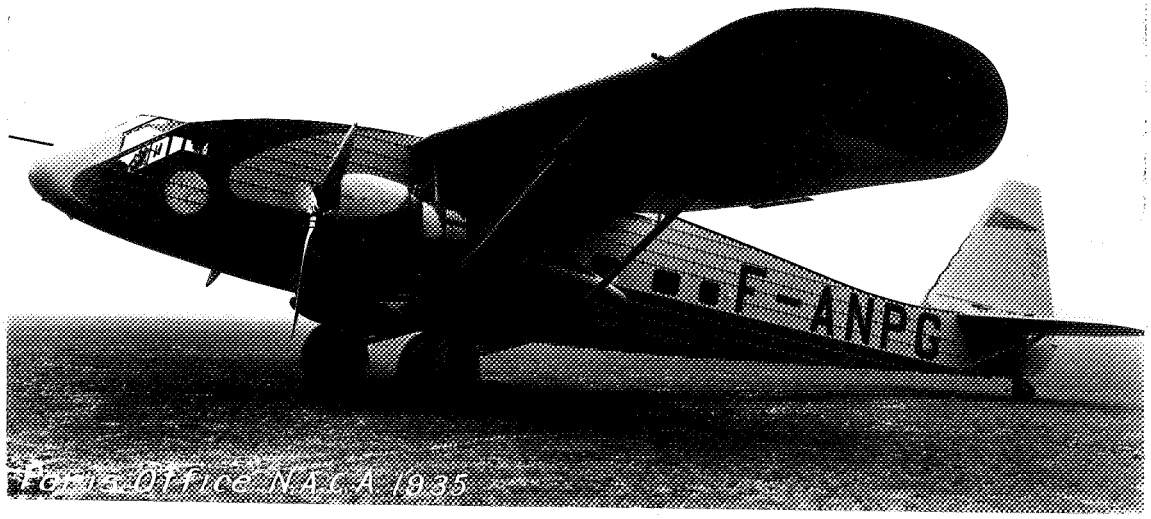




Figures 2,3,4.- Wibault 670 (2 Gnome-Rhone 14 Krsd)

18547A.C.





Figures 5,6.- Potez 620 (2 Gnome-Rhone 14 Krsd) 18548 A.C.

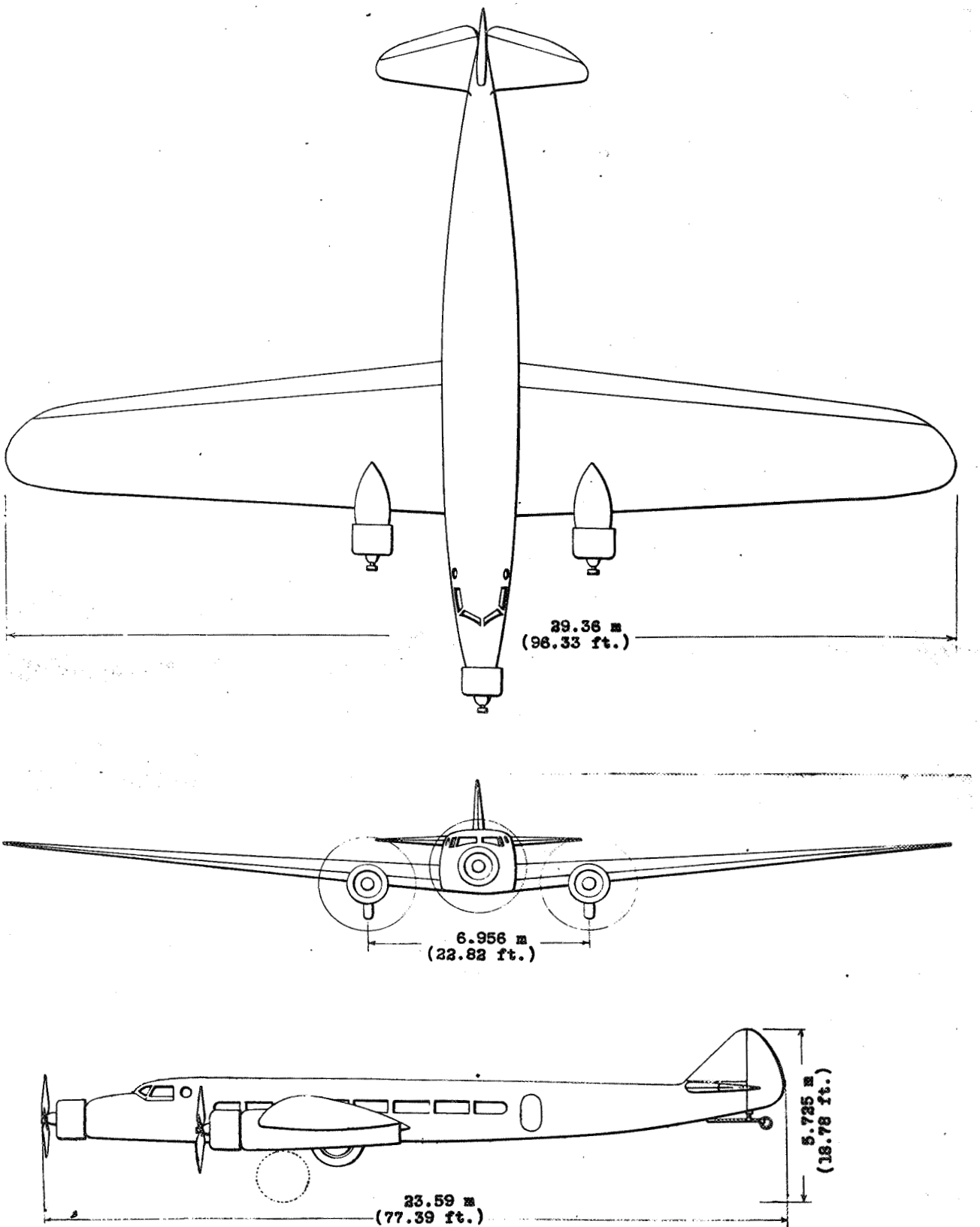


Figure 7.-Dewoitine D.620 30 passenger monoplane.
(Three 800 hp. Gnome-Rhône engines)

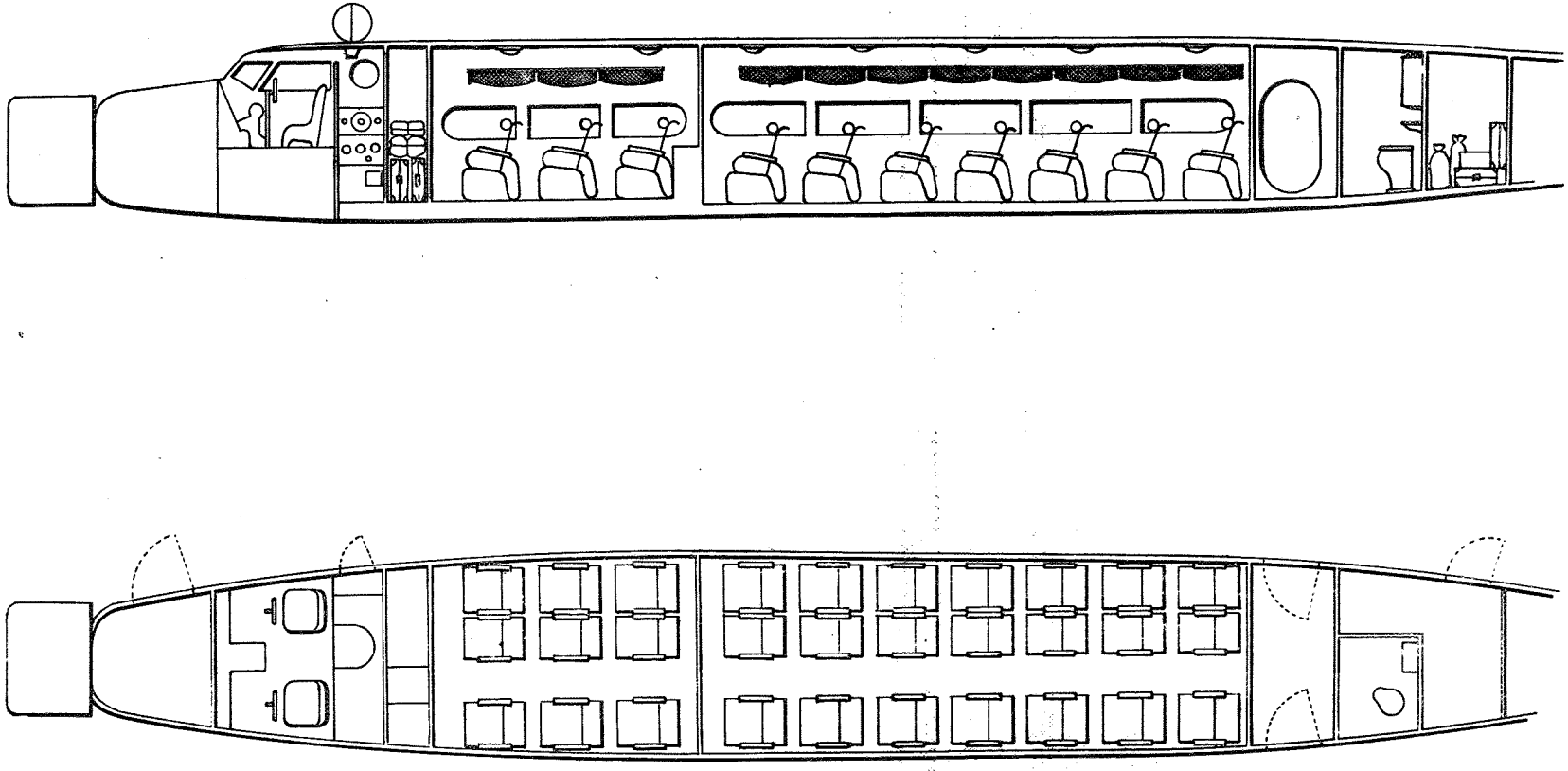
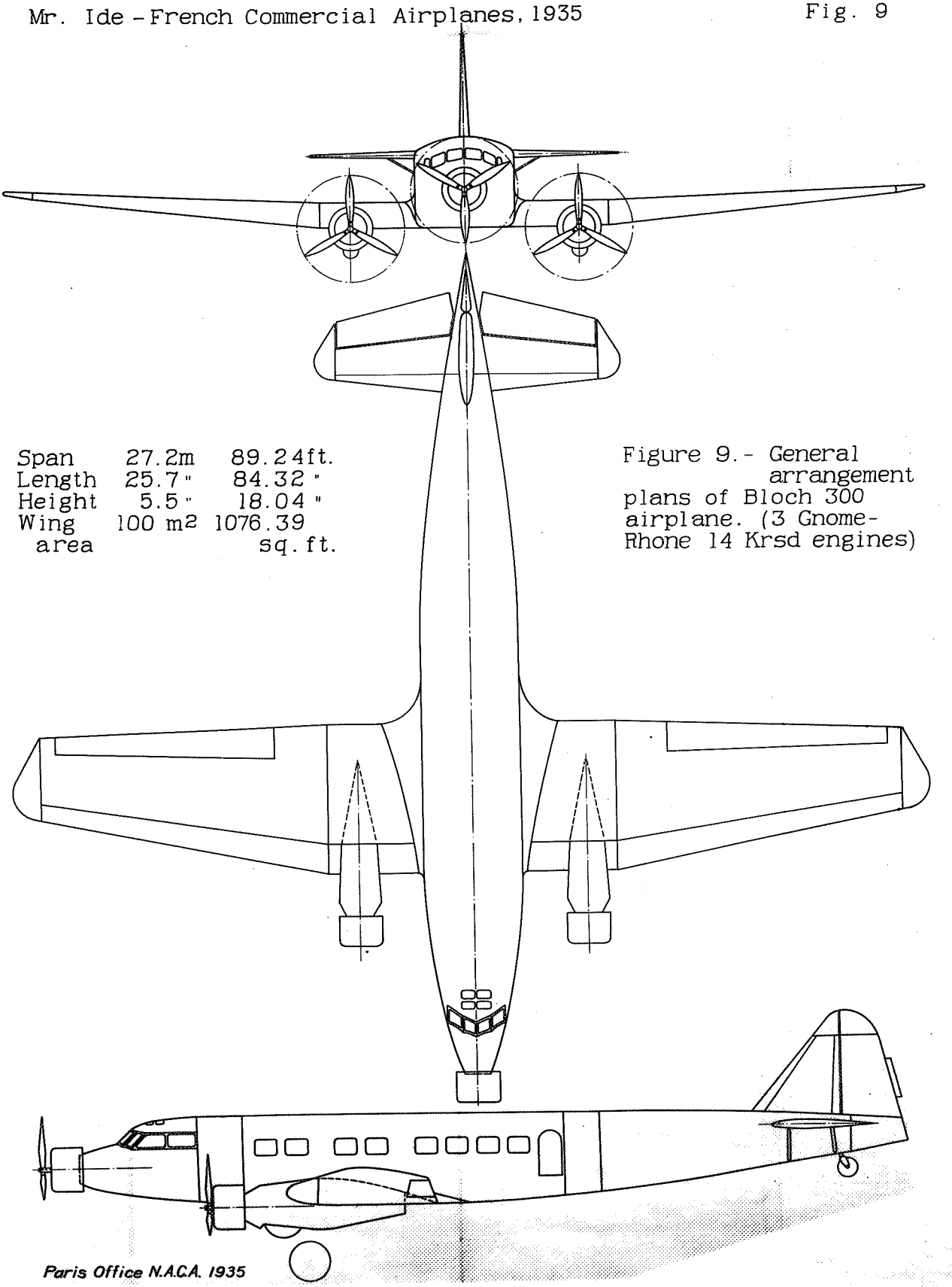


Figure 8.- Longitudinal section and plan of Dewoitine D 620 (3 Gnome-Rhone 14 Krsd)



Span	27.2m	89.24ft.
Length	25.7"	84.32 "
Height	5.5"	18.04 "
Wing area	100 m2	1076.39 sq.ft.

Figure 9.- General arrangement plans of Bloch 300 airplane. (3 Gnome-Rhone 14 Krsd engines)

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